Basic Health, Women's Health, and Mental Health Among Internally Displaced Persons in Nyala Province, South Darfur, Sudan

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Objectives. We assessed basic health, women's health, and mental health among Sudanese internally displaced persons in South Darfur.

Methods. In January 2005, we surveyed 6 registered internally displaced persons camps in Nyala District. Using systematic random sampling, we surveyed 1293 households, interviewing 1 adult female per household (N = 1274); respondents' households totaled 8643 members. We inquired about respondents' mental health, opinions on women's rights, and the health status of household members.

Results. A majority of respondents had access to rations, shelter, and water. Sixty-eight percent (861 of 1266) used no birth control, and 53% (614 of 1147) reported at least 1 unattended birth. Thirty percent (374 of 1238) shared spousal decisions on timing and spacing of children, and 49% (503 of 1027) reported the right to refuse sex. Eighty-four percent (1043 of 1240) were circumcised. The prevalence of major depression was 31% (390 of 1253). Women also expressed limited rights regarding marriage, movement, and access to health care. Eighty-eight percent (991 of 1121) supported equal educational opportunities for women.

Conclusions. Humanitarian aid has relieved a significant burden of this displaced population's basic needs. However, mental and women's health needs remain largely unmet. The findings indicate a limitation of sexual and reproductive rights that may negatively affect health. (*Am J Public Health.* 2007;97:353–361. doi:10.2105/AJPH.2005.073635)

United Nations (UN) officials have described Darfur as the worst humanitarian crisis in the world.[1] Despite the January 2005 accords ending 23 years of North–South civil war, conflict continues in this impoverished western region of Sudan. The Darfur crisis escalated in early 2003 with rebel insurrections against the government of Sudan. Government forces and Arab militias have since conducted a campaign against local populations, displacing more than 200 000 refugees into Chad and 1.8 million people within the greater Darfur region.[2] The death toll from disease and violence is unknown, with estimates ranging from 180 000 to 390 000.[3,4] Widespread violations of human rights and international humanitarian law occurred, including incidents of rape, killing of civilians, and large-scale destruction of villages.[5] The UN has cited occurrences of war crimes and crimes against humanity[5] and other groups have warned of genocide.[6]

An estimated 3.6 million people—more than half of Darfur's preconflict population—have been affected by the crisis.[7] Although aid reaches the majority of this conflict-affected population, escalating violence has limited operations and decreased the proportion of UN-accessible populations from 90% in mid-2005 to 72% in early 2006.[7] At the time of the study, banditry, harassment, and regional fighting limited humanitarian aid, particularly in South Darfur.[8]

To date, needs assessments in Darfur have predominantly focused on malnutrition and mortality rates.[9–11] Mental health and women's health burdens in this population remain largely unknown despite women heading 65% to 84% of internally displaced households in South Darfur.[9] International Medical Corps conducted a rapid population-based needs assessment of internally displaced persons (IDPs) in Nyala, South Darfur, to help appropriate services for basic needs and women's and mental health.

METHODS

Sampling

The greater Darfur region of western Sudan has an estimated population of 6.5 million[12] and covers an area three fourths the size of Texas (approximately 196 000 mi).[2] It comprises 3 states: North, West, and South Darfur. Logistic and security constraints limited our study to Nyala, the largest of 9 districts in South Darfur State.

We surveyed 6 of 9 registered IDP camps in Nyala. At the time of the study, Nyala hosted nearly 40% of South Darfur's registered IDP population (267 450 of 701 872), and included Kalma, the largest IDP camp in Darfur. The 6 camps were Kalma (142 125), Al Sheref (30 899), Otash (17 650), Billel (11 882), Mosei (11 099), and Deleg (8881).[7] Overall, the sample represented 83% of the total IDP population in Nyala (222 536 of 267 450), or 32% of the total IDP population in South Darfur (222 536 of 701 872). Three camps were excluded because of insecurity or inadequate number of IDPs for sampling (<2000 people).

To determine an appropriate sample size for this study, we assumed a prevalence of major depression of 0.05, with a margin of error of ±0.01 at a 90% confidence level. The sample size required given these conditions was 1293 households. We assumed a mean household size of 6 people[9] and used systematic random sampling to survey 1293 households in proportions relative to the population size of each camp (Table 1). We used a combination of maps based on satellite

TABLE 1—Demographic Characteristics of Internally Displaced Women (N = 1274) in Nyala Province: South Darfur, Sudan, January 2005

	No. (%) or Mean ±SE (Range)
Camps surveyed (n = 1265)	
Kalma	772 (61)
Al Sheref	120 (9)
Otash	116 (9)
Billel	81 (6)
Mosei	78 (6)
Deleg	107 (8)
Months of displacement (n = 1233)	6.1 ±0.12 (0.1–28)
Months in present camp (n = 1237)	5.8 ±0.12 (0.01–25)
Mean household size in camp (n = 1269)	6.4 ±0.07 (1–30)
Area before displacement (n = 1270)	
Urban	793 (62)
Rural	477 (38)
Age of respondent (n = 1252), y	34 ±0.29 (16–85)
Marital status (n = 1274)	
Married	1010 (79)
Widowed	154 (12)
Divorced/separated	54 (4)
Husband Missing	49 (4)
Never married	7 (1)
Marital wife status (n = 1190)	
First wife	827 (69)
Second wife	296 (25)
Third wife	55 (5)
Fourth wife	12 (1)
Ethnicity/tribe (n = 1233)	
Fur	474 (38)
Zaghawa	228 (18)
Arab	119 (10)
Daju	107 (9)
Baygo	72 (6)
Massalit	55 (4)
Other[a]	122 (10)
Religion (n = 1274)	
Muslim Sunni	1261 (99)
Christian	13 (1)
Occupation (n = 1270)	
Farmer/Herder	654 (51.6)
Housewife	454 (36)
Unemployed	92 (7)
Service sector	28 (2.2)
Professional	19 (1.5)
Retired	13 (1)
Clerical	4 (0.3)
Factory	3 (0.2)
Student	3 (0.2)

Note. Percentages may not add up to 100 because of rounding.
[a]Includes Tunjur (26); Dinka (22); Birgid (20); Habbania (19); Tama (13); Bederia (6); Gaam (5); Kineenawi, Logo, Tagoi (2 each); Debri, Falasha, Hamer, Hawawir, Nobin (1 each).

imaging and field surveying to determine the sampling frame within the camps.

Instrument

The questionnaire was written in English, translated into Sudanese Arabic, and back-translated into English by 3 native speakers. Three regional, human rights, and medical experts reviewed the questionnaire for content validity, and the survey was pilot-tested with 6 Sudanese IDPs in Sudan. Interviewers administered the survey in Arabic, the lingua franca among the majority of the tribes represented in the camps.[13] The survey contained 102 questions on respondent demographics, basic needs, morbidity, mental and women's health, and opinions regarding women's rights and roles in society. We asked about events since the holiday of Eid al-Adha, 2003, which coincided with rebel insurrections in February 2003.

We assessed for the prevalence of major depressive disorder using the Patient Health Questionnaire, a well-validated, highly sensitive instrument for identifying individuals with current and past depression.[14,15] Major depression was diagnosed if 5 or more of 9 depressive symptoms were present nearly every day during the previous 2 weeks. This corresponded with a cutoff score of 15, which has been found to be valid in predicting a clinical diagnosis of major depression.[14] Questions regarding suicidal ideation[16] and suicide attempts[17] over the past year among household members were reported as yes or no responses. Women's rights and roles in society were assessed by a response of agree or disagree. These rights were selected on the basis of health and human rights concerns identified in other studies.[18–20] Mental health counseling was defined as "having someone to talk to about your problems who will listen and give emotional support."

Interviews

As part of the International Medical Corps field team, we recruited 16 data collectors who underwent 3 days of classroom teaching and role playing followed by several days of field observation. Government officials approved all data collectors and granted permission for the study without limitations. We also sought and received support from local sheikhs, who encouraged household members to respect the privacy of the interviews.

All interviews were conducted during a 1-week period in January 2005. A household was defined as people sleeping and eating under the same roof or in the same structure. A non-Arab, who was a woman, Sudanese data collector interviewed the household female (aged ≥15 years or emancipated minor) who could most accurately provide information about the experiences of the entire household. Interviews lasted approximately 30 minutes and were conducted in the most private setting possible. Questionnaires were reviewed for completeness after the interview by the interviewers and by team leaders daily.

Statistical Analysis

The data were analyzed with Stata version 8.0 statistical software (Stata Corp, College Station, Tex). To test differences in proportions, statistical significance was determined using the Pearson χ^2 statistic. For those cross-tabulations containing cells with expected frequencies of fewer than 5, statistical significance was determined with the Fisher exact test; a Yates corrected χ^2 was used for all others. Analysis of variance was used for statistical comparison of means. For all statistical determinations, significance levels were established at $P<.05$.

RESULTS

Respondent Characteristics

Of the 1293 households sampled, 1274 female heads of household participated in the study (98.5% response rate). Demographics of the respondents are presented in Table 1. Mean household size was 6.4 (±0.07) persons. The mean age was 34 (±0.29) years (range, 16–85 years). The majority of the women sampled were Muslim (99%), married (79%), farmers or pastoralists (52%), and from either the Fur or Zaghawa tribes (55%). The 1274 household respondents reported on the experiences of 8643 household members, including themselves. Households in this study were displaced from all 3 Darfur states. The mean duration of displacement from home was 6.1 (±0.12) months.

Basic Needs

Although there were gaps in coverage of basic needs, the majority of IDPs had some access to rations, shelter, and potable water. Overall, 78% of households (923 of 1187) reported receiving some rations, including any type of flour, oil, or beans (Table 2). Sixteen percent of all households (200 of 1254) had no shelter or had minimal cover (open-air lean-tos, mats, boxes). The mean number of blankets was 1.2 for an average household size of 6.4 persons.

Although the majority of water sources were protected, per person water consumption was low and boiling of water was not practiced. Ninety-nine percent of households (1246 of 1254) reported the use of water bladders or other protected sources of water. The average use of water was 7.6 liters per person per day for drinking, cooking, and hygiene. Nearly 80% of households reported insufficient fuel to cook meals or boil drinking water. Methods of obtaining fuel included collection of firewood or grass by women (62%), collection by children (9%), and purchase of fuel (25%).

Morbidity

During the previous week, 12% of all household members (1042 of 8643) and 19% of children aged younger than 5 years (366 of 1864) had 1 or more symptoms of diarrhea or cough (Table 3). Forty-nine percent of household members with illness (570 of 1162) accessed medical care. Diarrhea was the most commonly reported illness among children aged younger than 5 years (18%), followed by symptoms of acute respiratory infection (4%). Only 35% of respondents (445 of 1273) knew how to mix oral rehydration solution, and fewer than 30% (354 of 1274) had access to the solution packets. Among women aged 15 to 49 years, 13% (242 of 1900) had received a tetanus vaccination while in the camp.

Women's Health

Overall, women in this study expressed limited sexual and reproductive rights.

TABLE 2—Characteristics of Basic Needs of Internally Displaced Women (N = 1274) in Nyala Province: South Darfur, Sudan, January 2005

	No. (%) or Mean ±SE (Range)
Main reason for coming to camp (n = 1244)	
Forced to leave home	442 (35)
Loss of shelter	343 (28)
In need of emergency assistance	246 (20)
Unable to access food	213 (17)
Main problems since coming to camp (n = 974)[a]	
Food	646 (66)
Lack of financial means	221 (23)
Shelter	211 (22)
Personal safety/security	114 (12)
Clothing and blankets	46 (5)
Access to medical care	17 (2)
Drinking water	6 (0.6)
Sanitation	4 (0.4)
Households reporting stores of distributed rations	
Flour (n = 1187)[b]	923 (78)
Oil (n = 1185)[b]	823 (69)
Beans (n = 1170)[b]	414 (35)
Protein biscuits (n = 1167)	172 (15)
Households reporting nondistributed food items in camp (n = 1274)	1168 (92)
Amount of meat, kg[c]	0.6 ±0.05 (0–30)
Main source of drinking water (n = 1254)	
Water bladder	562 (45)
Protected borehole with pump	366 (29)
Communal tap	217 (17)
Trucked in water	85 (7)
Protected well	16 (1)
Unprotected source[d]	8 (0.7)
Amount of water obtained per person per day (n = 1270), liters	7.6 ±0.11 (0–34)
Households that boil drinking water (n = 1264)	
No	1192 (94)
Yes	72 (6)
Households with enough fuel to boil drinking water (n = 1258)	
No	1019 (81)
Yes	239 (19)
Households with enough fuel to cook meals (n = 1263)	
No	995 (79)
Yes	268 (21)
Main source of fuel (n = 1269)	
Women collect	789 (62)
Family purchases	314 (25)
Children collect	118 (9)
No fuel source available	35 (3)
Distribution in camp	13 (1)
Type of shelter respondents have in camp (n = 1254)	
Tent	519 (41)
Hut	328 (26)
Plastic sheeting/blankets	207 (16)
None	149 (12)
Lean-to made of palm, mats, cardboard, or brush	51 (4)
Blanket and clothing needs	
Blankets respondents have (n = 1271)	1.2 ±0.03 (0–10)
Blankets needed (n = 1273)	5.1 ±0.06 (0–20)
Household members who need clothing (n = 1261)	6.0 ±0.08 (0–21)

Note. Percentages may not add up to 100 because of rounding.
[a]May list more than 1 problem.
[b]Any type.
[c]The availability of meat, a nonration item, coincided with the Eid al-Adha feast (for which animals are sacrificed and shared).
[d]Unprotected sources include streams, rivers, uncovered springs, and nearby villages.

TABLE 3—Morbidity and Mental Health Among Internally Displaced Women and Household Members (N = 8643) in Nyala Province: South Darfur, Sudan, January 2005

	No. (%)
Children aged ≤5 years who received measles vaccination in the camp (n = 1864)	1002 (54)
Women aged 15–49 years who received tetanus vaccination in the camp (n = 1900)	242 (13)
Household members with 1 or more symptoms[a]	1042 (12)
Children aged ≤5 years with 1 or more symptoms (n = 1864)[a]	366 (19)
Respondents with cough or shortness of breath (n = 1025)	205 (20)
Children ≤5 years old with cough or shortness of breath (n = 1864)	82 (4)
Household members with bloody or nonbloody diarrhea (n = 8200)	410 (5)
Children aged ≤5 years with bloody or nonbloody diarrhea (n = 1864)	340 (18)
Household members with symptoms who accessed medical care (n = 1162)[a]	570 (49)
Respondents with oral rehydration solution packets (n = 1274)	354 (28)
Respondents who knew how to mix oral rehydration solution (n = 1273)	445 (35)
Respondents reporting feeling down, depressed, and hopeless (n = 1244)	780 (63)
Respondents reporting feelings of sadness or constant crying (n = 1274)	280 (30)
Major depression (score of 15 or more) on the PHQ-9) (n = 1253)	390 (31)
Respondents reporting suicidal ideation in the past year (n = 1257)	66 (5)
Respondents reporting suicide attempt in the past year (n = 1260)	28 (2)
Respondents reporting household member with suicidal ideation (n = 1134)	26 (2)
Respondents reporting household member who committed suicide (n = 1124)	21 (2)
Type of counseling respondents with major depression deem beneficial (n = 390)[b]	
International agencies	381 (98)
1-on-1 sessions	283 (72)
Group sessions	184 (47)
Religious counseling	127 (32)
Access to education/trade programs	65 (17)
Financial programs	49 (12)
Traditional healer	46 (12)
Local groups	35 (9)
Women's support groups	33 (8)
Issues that would make it difficult to seek counseling (n = 358)[b]	
Do not believe counseling is useful	121 (34)
Feeling ashamed	73 (20)
Nothing	67 (19)
Fear of community nonacceptance	46 (13)
Concerns about confidentiality	17 (5)
Fear of family nonacceptance	13 (4)
Interferes with household responsibilities	11 (3)

Note. PHQ-9 = Patient Health Questionnaire. Percentages may not add up to 100 because of rounding.
[a]Includes fever, productive or nonproductive cough, diarrhea with or without blood, shortness of breath, or total body rash during the previous week.
[b]May list more than 1.

Eighty-four percent of women (1043 of 1240) reported a history of female circumcision. Fifty-one percent of women (458 of 900) felt a wife must agree to sexual intercourse regardless of her willingness to participate. Only 30% of women (374 of 1238) reported that husbands and wives shared decisions on the number and spacing of children. Ninety-six percent (1219 of 1266) used either the natural or rhythm method or no form of contraception. Of women desiring but not using birth control, 63% (209 of 331) reported that their husbands would not allow contraceptive use.

Women also reported high pregnancy rates and limited perinatal services. The mean number of pregnancies was 6 (±0.09; range 0–20), with first pregnancy at age 18 (±0.08) years (range 12–45). Although 58% of respondents (723 of 1236) reported that prenatal care was accessible for all pregnancies, the mean number of pregnancies receiving prenatal care was 1.4 (±0.06). Of the remaining 42% (513 of 1236), reasons for the lack of prenatal care included the unavailability of services (89%), financial difficulties (47%), and husbands not permitting wives to seek care (27%). In general, 67% of respondents (853 of 1269) reported that they needed permission from a family member to access health care most or all of the time. Seventy-nine percent (912 of 1147) had at least 1 delivery by a traditional birth attendant; 20% (227 of 1147) were assisted by trained midwives. Fifty-three percent (614 of 1147) reported at least 1 unattended delivery. Overall, 30% of respondents (380 of 1262) were breastfeeding at the time of the study, and half of these women reported difficulties breastfeeding.

Attitudes on Women's Rights

Participants in the study expressed varying levels of support for women's rights (Table 4). Support was highest for equal access to education and legal protections of women's rights (84%–88%) and lowest for freedom of movement and expression (55%–68%). Seventy-seven percent of women (800 of 1040) felt that a good wife should obey her husband even if she disagrees, and 43% (444 of 1036) felt that a man has the right to beat a disobedient wife. Among married women, 61% (627 of 1027) felt pressured to enter marriage, and 20% (213 of 1069) were married without consenting.

Mental Health

Nearly one third of respondents (31%, 390 of 1253) met criteria for major depressive disorder (Table 3). Five percent of respondents reported suicidal ideation (66 of 1257), and 2% reported personal suicide attempts (28 of 1260) over the previous year. Two percent of households had a member that committed suicide during the past year (21 of 1124). Ninety-eight percent of women meeting

TABLE 4—Marriage, Family, and Reproductive Health Characteristics and Women's Rights Status of Internally Displaced Women (N = 1274) in Nyala Province: South Darfur, Sudan, January 2005

	No. (%) or Mean ±SE (Range)
Respondents who wanted to marry at the time of marriage (n = 1069)	856 (80)
Respondents who felt pressured by family to marry at the time of marriage (n = 1027)	627 (61)
Respondents who agreed that women should have the right to freely choose a husband and enter into marriage (n = 1092)	983 (90)
Family members who decide number and timing of children (n = 1238)	
Respondent only	94 (8)
Mostly respondent	52 (4)
Equal participation with husband	374 (30)
Mostly husband	198 (16)
Husband only	225 (18)
Other, including God, no one, no need	295 (24)
Respondents who agreed women should have the same right as her husband to determine timing and spacing of their children (n = 932)	559 (60)
Respondents who agreed that the decision to use birth control should be a shared decision of a woman and her partner (n = 1054)	974 (92)
Respondents who did not agree that the decision to use birth control should be a shared decision of a woman and her partner (n = 1054)	80 (8)
Respondents who agreed that the decision to use birth control should be decided by the woman only (n = 932)	103 (11)
Respondents who did not agree that the decision to use birth control should be decided by the woman only (n = 932)	829 (89)
Type of birth control used (n = 1266)	
None	861 (68)
Natural/rhythm method	358 (28)
Birth control pills	27 (2)
Homeopathic/herbal	9 (0.7)
Injectable birth control	9 (0.7)
IUD	2 (0.2)
Type of birth control desired (n = 846)	
None	689 (81)
Natural/rhythm method	83 (10)
Injectable birth control	35 (4)
Birth control pills	26 (3)
IUD	5 (1)
Homeopathic/herbal	4 (0.5)
Did not know	4 (0.5)
Reasons for not using birth control despite wanting to use it (n = 331)[a]	
Husband will not allow	209 (63)
Not available	48 (15)
Financial	36 (11)
Ministry of Health policy	14 (4)
Medical reasons	12 (4)
Other[b]	11 (3)
Respondents who were pregnant at the time of the study (n = 1253)	152 (12)

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criteria for major depressive disorder (381 of 390) felt that counseling provided by international agencies would be the most helpful.

DISCUSSION

Basic Needs

Despite the predominant use of protected water sources (92%), the low per person usage of 7.6 liters per day falls far short of Sphere recommendations of 15 liters per day[21] and raises concern about poor sanitation, hygiene, and communicable disease. Reasons for this finding may include the 50% decrease in rainfall this past year[22] and insufficient water infrastructure.[23] Supplying adequate quantities of water must be a high priority, even if it is of intermediate quality, to minimize water-related disease transmission.[24]

Darfur's climate exposes IDPs to drought and rainy seasons, dust storms, and extreme temperatures ranging from 40°F at night to 110°F during the day.[25] The lack of covered shelter, blankets, and clothing poses an increased risk for acute respiratory illnesses,[26] and the rains may increase potential for outbreaks of diarrheal diseases.[27] During the rainy season (May–October), adequate protection from the elements is essential.

Although overall food distributions have increased and anthropometric surveys have shown significant improvements in malnutrition indices in Kalma and throughout Darfur,[28,29] the findings confirm previous reports that IDPs are not receiving full sets of rations.[9] The World Food Programme warns of food shortages secondary to drought, poor harvest, rising prices, and a large shortfall in funds.[30] Most important, banditry and violence increasingly threaten humanitarian access to the estimated 3.5 million people requiring food aid.[31,32] In this volatile environment, disruption of assistance could result in dramatic rises in malnutrition and morbidity.

Morbidity

Diarrhea was the most commonly reported condition, particularly for children, and reflects poor water and sanitation practices; it is a leading cause of morbidity and mortality among disaster-affected populations.[26] The lack of oral rehydration solution and unfamiliarity with its preparation must be addressed

TABLE 4—*Continued*

Respondents' total no. of pregnancies (n = 1236)	6 ±0.09 (0–20)
Live births (n = 1255)	5 ±0.08 (0–15)
Respondents' opinion on the highest number of children a woman should have (n = 1225)	8 ±0.11 (0–25)
Pregnancies with prenatal care (n = 1132)	1.4 ±0.06 (0–9)
Prenatal care for all pregnancies (n = 1236)	723 (58)
Reasons for not receiving prenatal care (n = 513)[c]	
No services available	461 (89)
Financial	239 (47)
Not permitted by spouse	139 (27)
Restriction on movement	65 (13)
Not necessary	36 (7)
Work obligations	14 (3)
How often respondent must ask a family member to access health care services (n = 1269)	
All of the time	765 (60)
Most of the time	88 (7)
Some of the time	213 (17)
Rarely	170 (13)
Never	33 (3)
Attended birth of children (n = 1147)[a]	
Traditional birth attendant	912 (79)
Unattended	614 (53)
Midwife	227 (20)
Family member	144 (13)
Doctor	46 (4)
Nurse	37 (3)
Village health worker	19 (2)
Respondents who were breastfeeding at the time of the study (n = 1262)	380 (30)
Breastfeeding experience while in the camp (n = 353)	
No problems	173 (49)
Milk not consistent	129 (36)
Milk never came in	24 (7)
Milk dried	20 (6)
Unable to breastfeed because of conflict	4 (1)
Decided not to breastfeed	3 (0.08)
Respondents reporting gynecologic symptoms (n = 1274)[c]	709 (56)
Respondents with female circumcision (n = 1240)	1043 (84)
Respondents who agreed that a good wife obeys her husband even if she disagrees (n = 1040)	800 (77)
Respondents who agreed that a man has a right to beat his wife if she disobeys (n = 1036)	444 (43)
Respondents who agreed that it is a wife's obligation to have sex with her husband even if she does not want to (n = 900)	458 (51)
Respondents who agreed that any woman has the right to refuse sex (n = 1027)	503 (49)
Respondents who agreed that more should be done to protect women and girls from having sex when they do not want to have sex (n = 935)	545 (58)
Respondents who agreed that women should have equal access to education (n = 1121)	991 (88)
Respondents who agreed that there should be specific provisions in the constitution to protect women's rights (n = 1040)	873 (84)
Respondents who agreed that women should be able to associate with people of their choosing (n = 1086)	863 (79)
Respondents who agreed that women should have equal work opportunities (n = 1132)	866 (76)

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to help reduce morbidity and mortality secondary to diarrheal diseases.

Women's Health

Women compose the majority of the IDP population in Darfur and are among the most vulnerable groups.[9] In 2004, estimates of maternal mortality in Darfur were as high as 600 per 100 000 women.[24] Although crude mortality rates have improved overall, assessments of maternal mortality have been limited,[11] and an estimated 40% of women of childbearing age still remain without safe-motherhood services (prenatal, delivery, and postpartum care).[7]

Our findings are consistent with this poor state of reproductive health. Women reported high pregnancy rates, minimal family planning and prenatal services, and high rates of unattended and traditional birth attendant–assisted deliveries. They also expressed limitations of sexual and reproductive rights—including rights to consensual marriage and sexual intercourse and decisions on spacing and timing of children—which may negatively affect health.[19] Because women head the majority of households in South Darfur,[9] poor reproductive health and limited women's rights may by extension affect the health of the community.

Tetanus toxoid immunizations for women of childbearing age are a fundamental component of antenatal care,[33] and immunization of pregnant mothers can prevent maternal and neonatal tetanus. Neonatal tetanus results in an estimated 200 000 to 500 000 deaths annually in developing countries[34,35] and may occur as a result of septic deliveries, improper postnatal cord care, and mothers not being immunized.[36] Given the limited antenatal services, lack of skilled birth attendants, and low tetanus vaccination rate in this population, a high-risk strategy (vaccination of at least 90% of all women of childbearing age with 3 properly spaced doses of tetanus toxoid) may be necessary.[37]

Displaced women in emergency situations are also at increased risk of breastfeeding difficulties.[33] Nearly half of women surveyed reported difficulties breastfeeding, which emphasizes the need for infant feeding counseling and education programs. In emergency settings, breast milk is a hygienic, economical

TABLE 4—*Continued*

Respondents who agreed that women should be able to express themselves freely (n = 1069)	730 (68)
Respondents who agreed that women should be able to move about in public without restriction (n = 998)	547 (55)
Respondents who agreed that strict dress codes for women are appropriate (n = 997)	552 (55)

Note. IUD = intrauterine device. Percentages may not add up to 100 because of rounding.
[a] May list more than 1.
[b] Includes did not know (n = 7), no husband (n = 2), and more children needed (n = 2).
[c] Includes vaginal discharge, odor, pain, itching, abnormal bleeding; vaginal or rectal tears; chronic abdominal pain; or discomfort with urination, defecation, or vaginal intercourse.

food source that is important for conferral of immunity, nutrition, fertility regulation, and psychological well-being of mother and child. It is an essential preventive measure against diarrheal diseases.[38]

Women may be at risk of violence both within and outside of camps. There have been widespread reports of sexual violence in Darfur, particularly among women and girls foraging for wood beyond camp borders.[39] The predominance of women and children gatherers found in this study underscores the risk for these individuals and the need for security and alternative fuel provisions. Domestic violence rates were not assessed in this study, but the finding of 43% of respondents agreeing that a husband may beat a disobedient wife reflects attitudes and experiences that may have serious health consequences for women.

The 84% prevalence of female circumcision was consistent with previous estimates of 89% in Sudan.[40] Our finding does not include girls aged younger than 15 years who may have experienced circumcision (the custom may be practiced from infancy).[41] Health consequences include hemorrhage, infection, urologic and sexual dysfunction, difficulties with childbirth, and psychological complications.[41] A predominance of type III infibulation has been reported in Sudan,[40] and surgical defibulation may be necessary for safe deliveries.[42] The high prevalence of this traditional practice emphasizes the need for national policies, culturally sensitive educational programs, and appropriate health care, including obstetric and gynecologic services.

Mental Health

The prevalence of depression and suicide is a considerable mental health burden and challenge for humanitarian agencies in Sudan. The depression rate is comparable with other groups affected by complex emergencies.[43] The respondent rates of suicidal ideation and attempts were lower than findings among other conflict-affected populations.[18,20] The rates of attempts among women and household suicide prevalence, however, were still alarmingly high in comparison with general rates worldwide.[44,45]

Given elevated post-traumatic stress disorder rates and disability in other displaced populations,[43] the prevalence of depression in this study may reflect only a portion of the mental health burden. The combined impact of gender disparities and sustained stressors, such as low socioeconomic status, are known critical determinants of poor mental health.[43] Moreover, the effects of sexual violence, displacement, and livelihood disruption may contribute significantly to the mental health burden in this IDP population.[43,46]

In this context, few nongovernmental organizations offer formal mental health services to IDPs, and to our knowledge, preexisting services in the host population are nonexistent. Provisions for mental health historically have been limited and controversial in emergency settings.[47] It is noteworthy that 98% (381 of 390) of women meeting criteria for major depressive disorder felt that some form of counseling facilitated by international agencies might be helpful. In focus groups among IDPs in Darfur, women have also said that the provision of basic needs, security, education, and health care, in addition to counseling and psychosocial support, might help improve psychosocial well-being.[46] Although the optimal intervention in this population is unknown, World Health Organization recommendations include the integration of mental health services and local staff training into community-based health care programs.[47] As mental health and psychosocial programs develop, ongoing assessments of mental health needs and the monitoring and evaluation of programs will be essential.

Attitudes on Women's Rights

Although 84% of the women interviewed expressed the belief that there should be legal protection for the rights of women, many did not fully support women's rights, including freedom of movement, work, and expression. These limitations may reflect cultural norms, but they may also reflect camp circumstances. The weak support for freedom of movement (55%), for example, may be influenced by insecurity and fears of violence around the camps. By contrast, the strong support for equal access to education (88%) may reflect increased exposure of IDPs to schools in the camps.

Historically, Sudan has one of the lowest net school enrollment rates for girls in the world.[48] In Darfur, educational opportunities for girls have been limited for reasons including limited finances, a lack of schools, early marriage, and domestic responsibilities.[49,50] With the loss of land and livestock, and the establishment of UN-sponsored schools in the camps, many girls are in school for the first time, with lower primary classes composed of at least 40% girls in South Darfur.[50] Although gender parity has not yet been achieved and cultural and economic barriers remain, strong support for education of girls may reflect increasing sensitivities to the importance of education.[48,49]

As one of the strongest predictors of physical health status,[51] education may affect women's ability to make informed health-related decisions, access services, interact with health care personnel, and participate in treatment regimens.[52] In addition, schooling helps provide normalcy and psychosocial stability for children in conflict settings.[49] Maintaining support for educational programs will be crucial for women's and community health as humanitarians face funding shortfalls.

Limitations

A lack of security limited the geographic scope and questionnaire content to basic needs,

mental health, and limited domains of women's health. The findings of the study represent 222 536 IDPs residing in the 6 camps surveyed. The results cannot be generalized to all of Nyala, South Darfur, or other regions of Sudan. In addition, the study does not represent the host population or inaccessible areas of Nyala. Because humanitarian agencies have had full access to the camps included in our study, the findings on basic needs may be more favorable than for inaccessible IDP groups.

Cross-cultural differences may have influenced the mental health assessment, because the Patient Health Questionnaire was not validated for this population. The instrument has been used in another Arabic country[53] and other conflict-affected populations.[18,54] In addition, the findings are consistent with depression assessments that used different instruments in other displaced populations.[43] Although the limitations preclude firm conclusions about the prevalence of major depression in this population, the findings grossly indicate a large mental health burden where minimal provisions exist.

The findings in this study reflect the large-scale humanitarian effort in South Darfur and the relief of a significant burden of this displaced population's basic needs, including food, water, and shelter that is needed. Mental health needs remain largely unaddressed, however, and significant gaps in women's health needs remain. The limited sexual and reproductive rights identified in this study may also negatively affect women's health and by extension community health.

During the writing of this article, security continued to deteriorate and threaten humanitarian operations throughout Darfur. In early 2006, regional fighting displaced 70 000 people in South Darfur alone.[55] Peace talks in Nigeria are in jeopardy, and the situation has been referred to the UN Security Council. In the face of mounting insecurity and violence, the health burdens identified in this study present a formidable challenge for humanitarian agencies in Nyala. ■

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Contributors

G. Kim assisted with the study design, data collection and analysis, and article preparation. R. Torbay assisted with the study conception, analyses, and article preparation. L. Lawry originated the study and supervised all aspects of its implementation. Each author contributed substantially to the conception and design of the study, the analysis and interpretation of the data, and the drafting and revising of the article.

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Human Participant Protection

The Western Institutional Review Board, a for-profit organization in Olympia, Wash, offering independent institutional review board services, reviewed and approved this study. The ethics review board was guided by Title 45 of the US Code of Federal Regulations and complied with the Declaration of Helsinki. All data were kept anonymous. Verbal informed consent was obtained from all participants, who did not receive any material compensation.

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